

Impact of climate change on food production could cause over 500000 extra deaths in 2050

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Climate change could kill more than 500000 adults in 2050 worldwide due to changes in diets and bodyweight from reduced crop productivity, according to new estimates published in *The Lancet*. The research is the strongest evidence yet that climate change could have damaging consequences for food production and health worldwide.

The modelling study, led by Dr Marco Springmann from the Oxford Martin Programme on the Future of Food at the University of Oxford, UK, is the first of its kind to assess the impact of climate change on diet composition and bodyweight, and to estimate the number of deaths they will cause in 155 countries in 2050.

"Much research has looked at food security, but little has focused on the wider health effects of agricultural production", explains Dr Springmann. "Changes in food availability and intake also affect dietary and weight-related risk factors such as low fruit and [vegetable intake](#), high red meat consumption, and high bodyweight. These all increase the incidence of non-communicable diseases such as heart disease, stroke, and cancer, as well as death from those diseases."

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"Our results show that even modest reductions in the availability of food per person could lead to changes in the energy content and composition of diets, and these changes will have major consequences for health," adds Dr Springmann.

The study reveals that, unless action is taken to reduce global emissions,

climate change could cut the projected improvement in food availability by about a third by 2050, and lead to average per-person reductions in food availability of 3.2% (99 kcal per day), in fruit and vegetable intake of 4.0% (14.9g per day), and red meat consumption of 0.7% (0.5g per day).

The findings predict that these changes could be responsible for around 529000 extra deaths in 2050, compared to a future without climate change in which increases in [food availability](#) and consumption could have prevented 1.9 million deaths.

The countries that are likely to be worst affected are low- and middle-income countries, predominantly those in the Western Pacific region (264000 deaths) and Southeast Asia (164000), with almost three-quarters of all climate-related deaths expected to occur in China (248000) and India (136000). On a per-capita basis, also Greece (124 deaths per million people) and Italy (89 deaths per million people) are likely to be significantly affected.

Dr Springmann and colleagues used an agricultural economic model fitted with data on emission trajectories, socioeconomic pathways, and possible climate responses to evaluate the effects on global food production, trade, and consumption for 2050. They calculated the additional number of deaths linked to changes in diet and bodyweight under a middle-of-the road development scenario and four different climate change scenarios (high emission, two medium emission, and one low emission), compared to a world without climate change (panel page 4).

The model predicts that reductions in fruit and vegetable intake could lead to 534000 climate-related deaths far exceeding the health benefits of reductions in red meat consumption (29000 deaths prevented).

The biggest impacts of changes in fruit and vegetable intake are likely to be felt across high-income countries (accounting for 58% of all changes in deaths), in low- and middle-income countries (LMIC) of the Western Pacific (74%), Europe (60%), and the Eastern Mediterranean (42%). Southeast Asia and Africa top the list for underweight related-deaths in adults, accounting for 47% and 49% of all changes in deaths in 2050 respectively.

Climate change will have some positive effects with many climate-related deaths being offset by reductions in obesity (figure 2). However, the saving of around 260000 fewer deaths from obesity worldwide in 2050 is balanced by lower calorie availability and an increase in the number of deaths cause by people being underweight (266000 extra deaths).

Importantly, say the authors, cutting emissions could have substantial health benefits, reducing the number of climate-related deaths by 29-71% depending on the strength of the interventions. For example, in a medium emission scenario (increases in global average surface air temp of 1.3-1.4°C in 2046-65 compared to 1986-2005), the numbers of diet- and weight-related deaths could be reduced by about a third (30%) compared with the worst-case, high-emission scenario.

According to Dr Springmann, "Climate change is likely to have a substantial negative impact on future mortality, even under optimistic scenarios. Adaptation efforts need to be scaled up rapidly. Public-health programmes aimed at preventing and treating diet and weight-related risk factors, such as increasing fruit and vegetable intake, must be strengthened as a matter of priority to help mitigate climate-related health effects."

Commenting on the implications of the study, Dr Alistair Woodward from the University of Auckland in New Zealand and Professor John

Porter from the University of Copenhagen in Denmark write, "Restriction of our view of the consequences of [climate change](#) to what might happen in the next 30-40 years is understandable in terms of conventional concerns with data quality and model stability, but might underestimate the size of future risks, and therefore undervalue present actions needed to mitigate and adapt." They conclude "Springmann and colleagues have moved the climate and food debate in a necessary direction by highlighting both [food](#) and nutritional security, but a mountain of policy-relevant questions remain that require close scrutiny."

Provided by Lancet

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